305
Accession number:20122915250788
Title:Generation of low-frequency radiation by dense hot plasma under pondermotive action of a short laser pulse
Authors:Uryupin, S.A. (1); Frolov, A.A. (2)
Author affiliation:(1) Lebedev Physics Institute, Russian Academy of Sciences, Moscow, 119991, Russia; (2) Joint Institute of High Temperatures, Russian Academy of Sciences, Moscow, 125412, Russia
Corresponding author:Uryupin, S.A.(uryupin@sci.lebedev.ru)
Source title:Journal of Experimental and Theoretical Physics
Abbreviated source title:J. Exp. Theor. Phys.
Volume:114
Issue:5
Issue date:May 2012
Publication year:2012
Pages:878-891
Language:English
ISSN:10637761
Document type:Journal article (JA)
Publisher:Maik Nauka-Interperiodica Publishing, Profsoyuznaya Ul 90, Moscow, 117997, Russia
Abstract:The theory of the generation of low-frequency radiation under the pondermotive action of a femtosecond laser pulse on dense hot plasma is developed. It is shown that, at fairly high plasma temperatures, when electron-electron collisions are rare and the low-frequency field is excited under conditions of the anomalous skin effect, the generation efficiency can be close to maximal. The optimal generation conditions are achieved if the carrier frequency of the laser pulse is close to the plasma frequency and the pulse is tightly focused. Under irradiation by pulses with durations of tens to hundreds femtoseconds, terahertz radiation is generated in a broad angular range. © Pleiades Publishing, Inc., 2012.
Number of references:39
Main heading:Plasma diagnostics
Controlled terms:Plasma waves - Plasmas - Ultrashort pulses
Uncontrolled terms:Angular range - Anomalous skin effect - Carrier frequency - Dense hot plasmas - Electron-electron collisions - Femtoseconds - Low frequency - Low-frequency fields - Optimal generation - Plasma frequencies - Plasma temperature - Short laser pulse - Terahertz radiation
Classification code:744.1 Lasers, General - 932.3 Plasma Physics
DOI:10.1134/S106377611203020X
Database:Compendex